

Work Order ID 50688

July 21, 2009 8:40:18 AM

Page 1

Item ID: D212-664-207TRN

Accept

Revision ID: A

Item Name: Crosstube Turning Detail

Start Date: 07/21/2009 Start Qty: 1.00

Required Date: 07/31/2009 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: *WKF*

Date: 09-07-01 Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D212-664-247

Rev A

100

0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Mori Seiki CNC Lathe Large

Memo

0.00

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA706□2-Turn first side as per Folio FA706□3- File transition lines smooth.

Q.M 09 - 08 - 21 ①

110

0.00



QC

QC1- Inspect dimensions to dimension sheet

Quality Control

Memo

0.00

Q.M 09 - 08 - 21 ①

120

0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Mori Seiki CNC Lathe Large

Memo

0.00

1-Turn second side as per Folio FA706□2- File transition lines smooth.□3- Remove sand and plugs

Q.M 09 - 08 - 21 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 50688

July 21, 2009 8:40:18 AM



Page 2

Item ID: D212-664-207TRN

Accept



Setup Start



Revision ID: A

Item Name: Crosstube Turning Detail

Stop



Start Date: 07/21/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 07/31/2009 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130 	QC1- Inspect dimensions to dimension sheet	0.00							
QC Quality Control	Memo	0.00							A-m 09-08-210
140 	QC8- Inspect parts - second check	0.00							
QC Quality Control	Memo	0.00							<div> </div> <div> A4M 9-8-26 </div>
150 	Crosstubes Chemical Conversion	0.00							
HandFXtube Hand Finishing Crosstubes	Memo	0.00							<div> </div> <div> A4M 9-8-26 </div>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 50688

July 21, 2009 8:40:18 AM

Page 3

Item ID: D212-664-207TRN

Accept

Revision ID: A

Item Name: Crosstube Turning Detail

Start Date: 07/21/2009 Start Qty: 1.00

Required Date: 07/31/2009 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

DP 9-8-26

170

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack Location:

X-TUBE CELL

1 / - AUM 9-8-26

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

09/08/27

BT 09-827

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

July 21, 2009 8:40:18 AM

Page 1

Work Order ID: 50688

Parent Item: D212-664-207TRNRevA

Parent Item Name: Crosstube Turning Detail

Start Date: 07/21/2009

Required Date: 07/31/2009

Comments:

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D6008-132RevA		Manufactured	No			110	Each	20.0000	1.0000			
Crosstube extrusion												

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

LG

38340

20

20

38340

1 mk 04/08/07

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order: 50688
Description: Crosstube Assembly (205/212 Low Aft)		Part Number: D212-664-247
Inspection Dwg: D212-664-247 Rev: A		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.438	+/-0.010	0.438	/			
	2.680	+0.005/-0.000	2.685	/			
	2.680	+0.005/-0.000	2.682	/			
	2.687	+0.005/-0.000	2.686	/			
	2.802	+0.005/-0.000	2.806	/			
	2.906	+0.005/-0.000	2.907	/			
	3.009	+0.005/-0.000	3.014	/			
	3.112	+0.005/-0.000	3.112	/			
	3.250	+0.005/-0.000	3.250	/			
SIDE B	0.438	+/-0.010	0.438	/			
	2.680	+0.005/-0.000	2.685	/			
	2.680	+0.005/-0.000	2.682	/			
	2.687	+0.005/-0.000	2.680	/			
	2.802	+0.005/-0.000	2.806	/			
	2.906	+0.005/-0.000	2.907	/			
	3.009	+0.005/-0.000	3.014	/			
	3.112	+0.005/-0.000	3.112	/			
	3.250	+0.005/-0.000	3.250	/			
	128.27	+/-0.030	128.270	/			

Measured by: G.m	Audited by:	Prototype Approval: N/A
Date: 09.08.21	Date:	Date: N/A
Rev A	Date 08.11.07	Change New Issue (P/O D212-664-207)
Revised by: KJ/EC	Approved:	

824 6 5 200

Revised: 02/20/2017

3450 REA TRAD

PARTS LIST:

Qty	Part Number	Description
X	D212-664-247	CROSSTUBE ASSEMBLY (205/212 LOW AFT)
1	D6008-132	CROSSTUBE
2	D2940-1	SUPPORT
4	D3595-063-530	RUBBER CUSHION
2	D3660-1	CUFF
4	MS21920-28	CLAMP (OR MS21920-30)
44	CR3212-4-06	RIVET (OR M7885/3-4-06)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6008-132
FINISHED LENGTH = 128.27 ± 0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) PART IS SYMMETRIC ABOUT CENTERLINE.
- 6) WHEN MACHINING TAPER, RUN-OFF PART AT STOCK. BLEND OUT EDGE LONGITUDINALLY.
TRANSITION SHOULD BE SMOOTH.
- 7) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 8) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 9) SCRIBE DART PART NUMBER AND BATCH NUMBER ON INNER SURFACE OF TUBE WITH A
VIBRATING STYLUS.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1
THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE
D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE
CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY
AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A
LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN
CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

50688

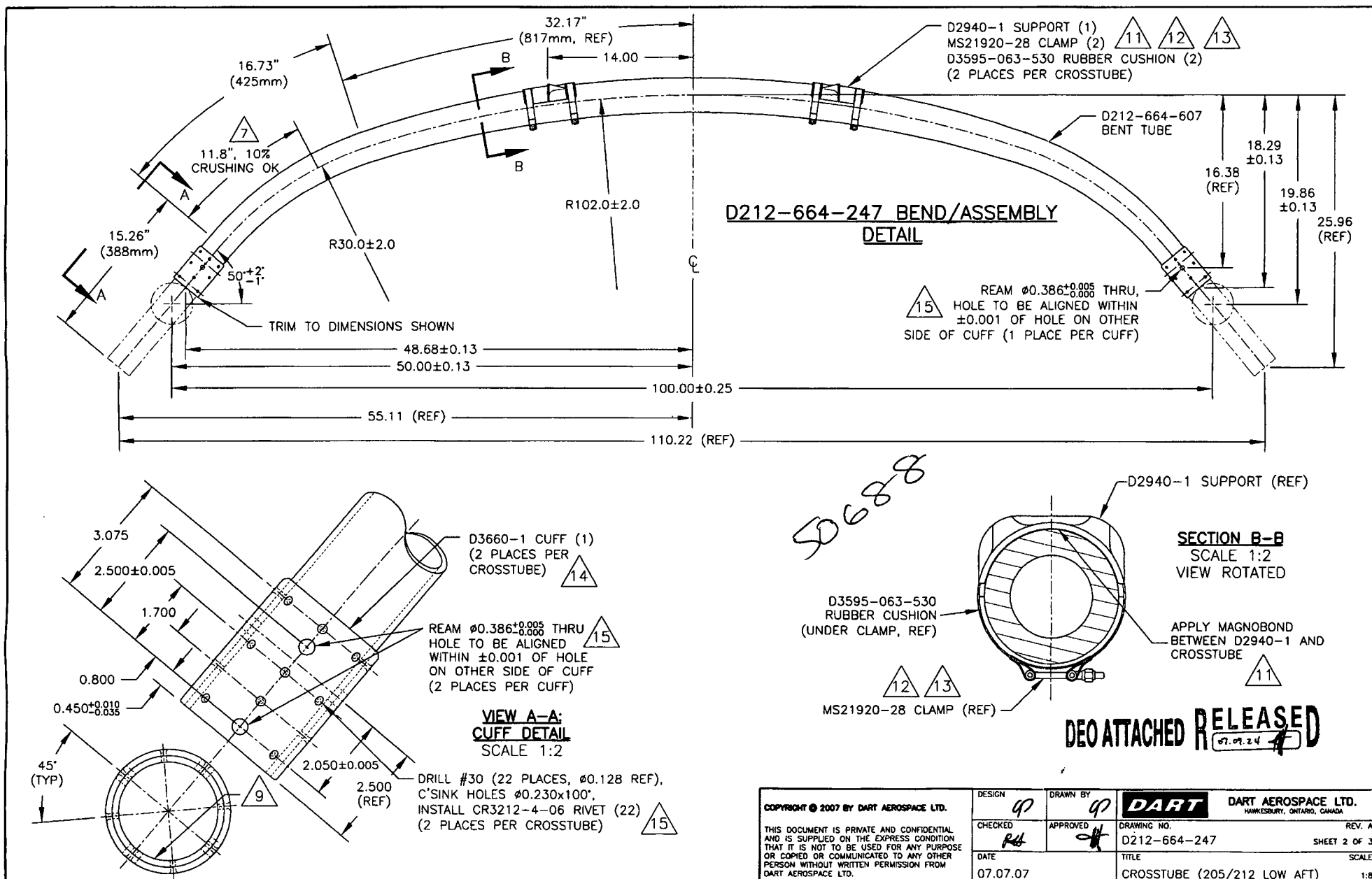
DEO ATTACHED
RELEASED
07.07.07

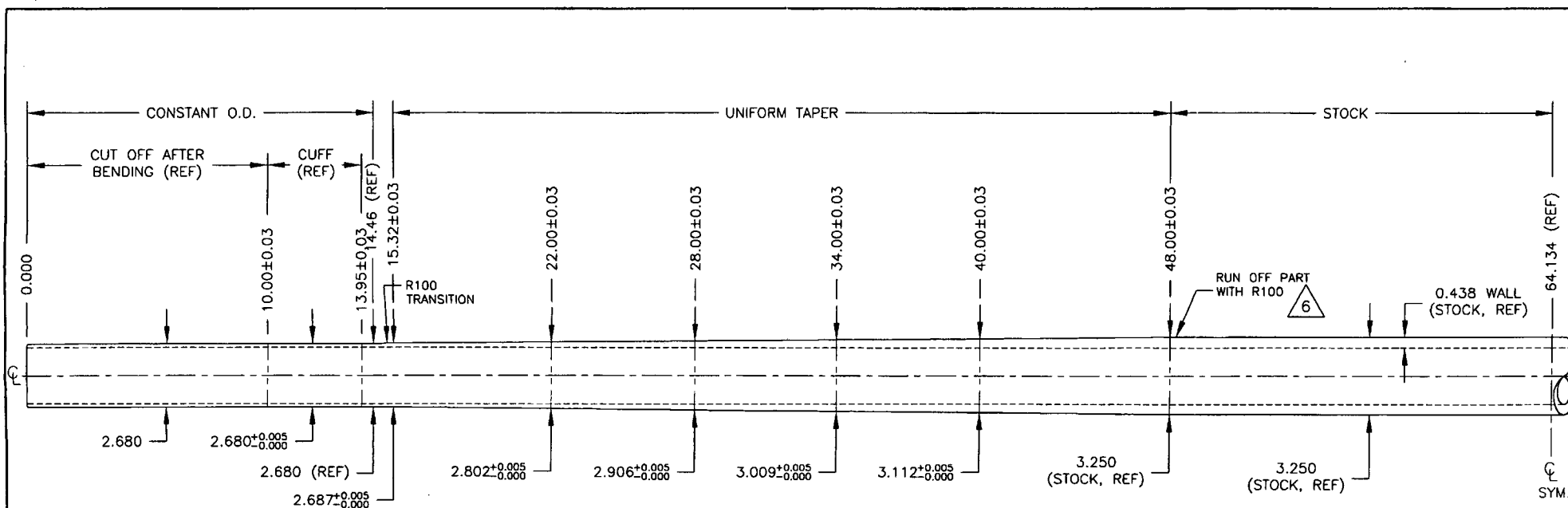
A		07.07.07	NEW ISSUE
DESIGN		DRAWN BY	DART DART AEROSPACE LTD. WARRICKSURY, OXFORD, CANADA
CHECKED		APPROVED	DRAWING NO. D212-664-247
DATE		TITLE	SCALE
07.07.07		CROSSTUBE (205/212 LOW AFT)	NTS

COPYRIGHT © 2007 BY DART AEROSPACE LTD.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL
AND IS SUPPLIED ON THE EXPRESS CONDITION
THAT IT IS NOT TO BE USED FOR ANY PURPOSE
OR COPIED OR COMMUNICATED TO ANY OTHER
PERSON WITHOUT WRITTEN PERMISSION FROM
DART AEROSPACE LTD.

REV. A
SHEET 1 OF 3





D212-664-247 MACHINING DETAIL

RELEASED
07.07.24
DEO ATTACHED

50688

COPYRIGHT © 2007 BY DART AEROSPACE LTD.		DESIGN <i>qp</i>	DRAWN BY <i>qp</i>	DART DART AEROSPACE LTD. HAMPSHIRE, ONTARIO, CANADA	REV.
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		CHECKED <i>qp</i>	APPROVED <i>[Signature]</i>		DRAWING NO. 0212-664-247
		DATE 07.07.07	TITLE CROSSTUBE (205/212 LOW AFT)		SCALE

DRAWING NO. D212-664-247	TITLE CROSSTUBE	REV. A	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-247-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>PH</i>	MFG. APPR. <i>AK</i>	APPROVED <i>AM</i>	DE APPR. <i>PH</i>			
DATE 09.05.01	DATE 09.06.15	DATE 09/06/22	DATE 09/06/22	DATE 09/06/22	DATE 09.06.22		

CHANGE:

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

Part Number	Description
D212-664-247B	CROSSTUBE ASSEMBLY (214 LOW AFT)

THE D212-664-247B CROSSTUBE HAS THE SAME PARTS LIST AS THE D212-664-247 CROSSTUBE. HOWEVER, INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D212-664-247 CROSSTUBE.

RELEASED
09/06/22 *PH*

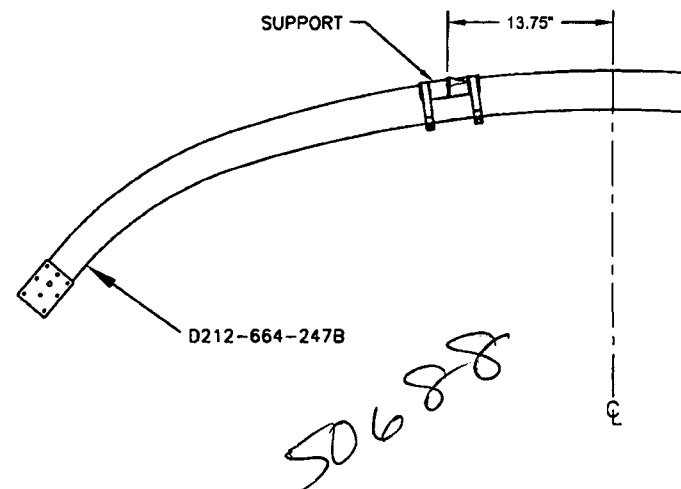


FIGURE 1 - SUPPORT INSTALLATION